

IIRR-Myanmar

An Emerging Portfolio of Climate Smart Agriculture options in Masein Village

**Bogale Township, Pyapon District, Irrawaddy Division,
Delta, Myanmar**

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Bogale Township is situated under the Irrawaddy delta region which is famous as rice bowl of Myanmar. The delta region is densely populated and plays a dominant role in Myanmar rice economy because of rich alluvial soil. These areas low as just 3 meters above sea level. It occupies 26% of total rice growing areas of the country. Masein, which is one of project's Climate smart villages, is under the administration of Bogale and about 7 miles from the town.

The main production of Masein village is rice, because of its relatively flat area suitable for rice farming. Other livelihoods include livestock production, betel leaves and nut, coconut, daily wages, small skill fishing and aquaculture, and petty trade.

Delta areas are the hot spots of vulnerability due to high impacts of climate change (sea-level rise, changes in waterway, runoff) proneness to annual floods. The Masein CSV has permanent set of wide drains criss-crossing the village because of occurrence of the annual floods.



Observed Climate Change in Masein Village

In most regions of Myanmar, temperatures are expected to rise by the middle of the 21st century by 1.3°C–2.7°C. Changes in rainfall patterns are projected to vary from region to region and season, with increases projected during the monsoon season. Both increases and decreases of rainfall are possible the rest of the year. The annual total rainfall increased slightly, with a greater rate of increase in this area than in other parts of the country and the monsoon season has become shorter by approximately one week on an average.

This area has experienced rising sea level and increasingly frequent and extreme hazards. Sea level rise alone will cause larger areas to be inundated during storm surges and coastal floods. This could be further augmented by increasing storm intensity.



Paddy field and vegetable home garden

Climate change impact on Agriculture

Climate change significantly affects Agriculture of the country, especially after cyclone Nargis hit Myanmar's Irrawaddy Delta region May 2, 2008. It ranked among the world's deadliest cyclones ever to make landfall. It had a heavy impact not only on people lives, but also on agriculture production, destroying 57 % of the country's total rice production. Although Masein was also the effected village during this disaster, in the degree of damage was lesser than that of other villages along the coastal line.

During Participatory Vulnerability Assessment which conducted in 2017 by IIRR climate change was not different from other villages in Delta: sea level rise, annual flooding, rainfall and temperature increases.

Higher water levels as results of sea level rise, is the major concern for the community in Masein: the risk of flooding of rice lands and the challenge of rice-drying at harvest-time.

This is due to irregular and unpredictable rainfall during harvesting time in November. Serious damage to quality of the rice can result in lower incomes.

Climate Change Impact on Livestock

Although Livestock is not a major dominant livelihood activity, it can largely support and contribute the households' total incomes for community in Masein village. Common type of livestock at Masein village includes pigs, ducks, and poultry.

Aftermath of Nargis disaster, there was significant loss and damage to livestock, farming animal and shelters and also on fishing and aquaculture. As a result of flood events and storm surge, the community reported losses of feedstock of small animals (pigs, ducks and poultry) and also damage to shelters.

Climate Smart Agriculture Options for Masein Village

1. School Garden

A school garden is a powerful environmental education tool. Through gardening, students have an opportunity to engage in agricultural practices on a small scale, learning about the responsibilities and impacts of land cultivation. School gardens teach students where their food comes from and how it grows.

In Myanmar, almost all the school in rural area large spaces of vacant lands with was being done including Masein village are allocated. For this reasons, IIRR and implementing partner Radanarayera local NGO have attempted to start with a modest level of activity: Introduction of five indigenous species of banana garden, two fish ponds with major two types of fish and one garden for vegetables production, in coordination with Teacher and Parents association of the village. Challenges still remain in engaging teachers and students.



2. Intensification of Livestock production vispropagation center

Livestock products are an important agricultural commodity for food securitybecause they provide valuable protein. The livestock sector is a major livelihood for the landless and for marginal farmers sources of food. Livestock activity major contributes to enhancing resilience of the community to climate change impact and risks.

a. Pig rising

Pig is a common and popular livestock across the country many households in rural community rich farmers maintain pigs as income generation options. As an inception activity of CSA options in Masein village, 10 farmers are underluckingpig raising with local native species starting from 2017.

To address the limited availability of feed as a result of floods events and surge storms, IIRR has introduced one of the fodder crops (Trichanthera) especially for pig and even for duck (to grow in the house compound). Trichanthera tree is very promising fodder crops because of its protein nutrient content is used and traditionally as forage use for pigs and rabbits in New Zeeland it is adaptive to wide range of climate condition.





Trichanthera plants at home compound and seedlings

b. Duck rearing

Duck rearing is an important livelihood activity and plays an important role for Delta areas of Myanmar (Maesein village as well). Duck raising it can be managed easily by women for their socio-economic enhancement. As an inception activities of CSA options 5 farmers of Masein village community specifically addressed to poor and women headed households, are starting duck rearing for egg production with the support of IIRR income is already being generated from sale of eggs.





Small Skill Duck rearing at Masein Village

c. Fish Raising

Fishing and aquaculture is very common for delta region and a main livelihoods as rice cultivation for some HHs of the community. However, there was no systematic practice is fish raising in Masein village. They rely only on natural ponds, lake and creeks to catch fish.

From the nutrition point of view, fish consumption is a source of energy and high quality protein and also a key source of other nutrients such as minerals, trace elements, fat-soluble vitamins and essential fatty acids.

Small-scale fisheries and aquaculture is promising livelihood activity for landless and marginal farmers especially in relation to food security and nutrition. To strength the capacity of the community for fishery and aquaculture, 5 HHs of village community, have been introduced the practice of fish rising in (drains) ponds within their gardens by supporting the distribution of fingerlings of indigenous species of local fish tilapia.



Small skill fishery in home garden compound

3. Intensification of Home stead production (under story garden)

a. Betel leaf garden

Under-story gardening is involves the use of shade tolerant within can shrubs or treesa row under the canopies of other trees.Masein village's campus is full of coconut and betel nut trees and shading of spaces suggest a potential for ginger, turmeric, black pepper, betel leaves, etc. Betel gardening has been introduced in Masein village (chewing betel is popular in Myanmar and most of the men, even few women, have this habit). Accordingly, the betel leafs in market demand. 15 HHs of Maseinvillage, have been supported with cuttings of betel leaves and bamboo poles for betel leaf gardening. Income is being generated in less than a year.

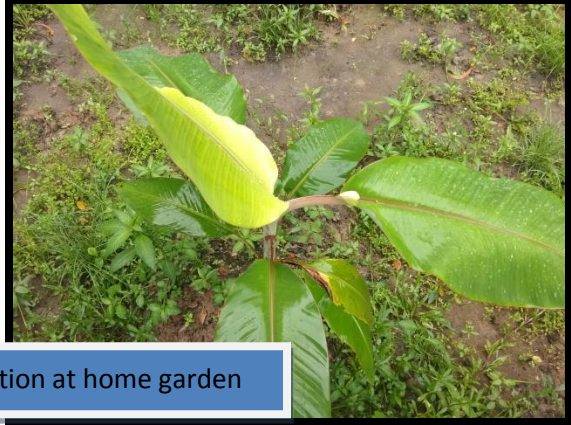


land preparation and betel leaf cultivation under coconut trees

b. Banana and Custard apple gardening

The intensification of home stead production is also being pursues with fruit trees. Masein village area is often flooded at the duration of full moon day's high tide and only few types of fruits trees except coconuts and betel adaptive well to local land and environmental situation. Besides banana tree is plant which can be grown commercially in this region, especially on raised beds not easily subjected to floods. Seedlings of banana have been distributed to 10 HHs of community-based on other preferences for variety.

Another type of fruit trees which adaptive well for this region is water apple. Currently there are some trees which are growing well in the village. This is also a potential opportunity for cash income although the price in local markets is low. One full grown plant can produce three times per year. For this reason, to strengthen the cultivation of water apple, 10 families of community have provided seedlings in order to further test market opportunities of water apple.



Banana tree plantation at home garden



Detail of Project inspection activities of CSA options for Masein village (2018 Crops season)

Opening Activities 2018 Cropping Season	# of HHs
Introduction School Garden for vegetable and fish production	1
2 Fish ponds, one for snake headed fish and one for Tilapia	1
3 varieties of Banana tree plantation in the backyard of Fish ponds	
Vegetable garden	
Advocacy of School garden with Parents and Teacher Association	
Intensification of Home Stead production	30
Fruits tree plantation of Java Apple, Banana	10
Betel Leaf plant cultivation	20
Intensification of household-level livestock and fish culture	21
50 ducklings for each HHs	5
Tilapia cultivation	5
2 piglets for each household for breeding	10
Tricanthera Plant as Fodder crop for Pig	

Summary and Tentative plans of CSA options for Masein village

Climate Smart Agriculture options are very locally specific and the options will be varied depending on agro ecological zones and culture and nature of the community. All the options will not be constant ways of practices and methodology; it may be variable according to the climate change occurrence.

Accordingly, annual planning and reviewing workshop will be held every year during project implementation, in coordination with each partner organizations and with support agencies (Food security working group, Yezin Agricultural university, Department of Agriculture Research Stations) to develop more locally adaptive strategy and options for climate smart agriculture options for each agro-ecological zones.

The opportunities to scaling our duck raising, pig production and fish raising have been demonstrated. Better targeting of social group will be pursued. The indigenous potential for fish culture in existing drains as well as for semi-commercial tilapia a pond is promising and will need to be further tested with larger number of households and with better training/capacity development. Better selection of sites for banana should be considered to reduce flooding risks.

